Armour's Warehouse
(Hogan Grain Elevator)
William Street west of Main Street, North
side of Illinois and Michigan Canal
Seneca
Lasalle County
Illinois

HAER No. IL-25

PHOTOGRAPHS

REDUCED COPIES OF MEASURED DRAWINGS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historical American Engineering Record
National Park Service
U.S. Departmetn of the Interior
Washington, D.C.

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HISTORIC AMERICAN ENGINEERING RECORD

ARMOUR'S WAREHOUSE
(Hogan Grain Elevator)

HAER No. IL-25

Location: North side of Illinois and Michigan Canal, on William Street west of Main Street, Seneca, LaSalle County, Illinois.

USGS Seneca Quadrangle
UTM Coordinates: 16.365120.4574750

Present Owner: State of Illinois, Department of Conservation

Present Use: Grain elevator

Significance: Armour's Warehouse is the largest and oldest of the remaining grain elevators on the Illinois and Michigan Canal. Grain elevators such as this one served as storage facilities for grain brought by local farmers for shipment on the I & M Canal and, later, on the railroad.

PART I. HISTORICAL INFORMATION

A. Physical History

1. Date of erection: 1861-1862. John Armour received the deed to the property in 1860. Sanborn Fire Insurance maps cite building date as 1861. The 1886 History of LaSalle County records that the grain elevator was built in 1862.

2. Architect: Unknown.

3. Original and subsequent owners: The following is the chain of title to the property on which the grain elevator stands, according to the LaSalle County Recorder's Deeds and Circuit Clerk's Office. The property is section 23, township 33, range 5, Block 3 of Armour's Addition to the original town of Crotty, except for a 90' strip of land along the north side of the Illinois and Michigan Canal. The 90' strip was always leased from the State of Illinois.

1860 Deed November 1, 1860 filed November 7, 1860 in
Book 74 page 249, $1900, (lot, no building mentioned)
Jeremiah Crotty
to
John Armour

1868 Will February 3, 1868, Circuit Clerk Office, Probate Records
All of blocks 2 & 3, "together with Armour's Warehouse in Seneca sold to James Armour, for $21,200."

1873 Deed April 1, 1873, filed June 10, 1873 in Book 160 page 475
James Armour's widow and heirs
to
Nelson J. Rulison and Michael Byrne

1877 Deed January 4, 1877, filed January 18, 1877
Book 174 page 164
Nelson J. Rulison and Michael Byrne
to
Guy C. Griswold

1882 Deed June 24, 1882, filed August 12, 1882
Book 178 page 400
Guy C. Griswold
to
Nelson J. Rulison

1883 Deed April 21, 1883, filed February 26, 1897
Book 326 page 468, for railroad right of way
Nelson J. Rulison
to
Kankakee and Seneca Railroad Company

1886 Agreement to purchase, December 1, 1886
Book 247 page 247
Nelson J. Rulison
to
M. J. Hogan and H. Neilson

1890 Deed November 20, 1890, filed December 1, 1890
Book 266 page 206
Nelson J. Rulison
to
Martin J. Hogan and Howard Neilson

1906 Deed June 2, 1906, filed June 4, 1906
Book 464 page 244, incorporation
Martin J. Hogan
to
The M. J. Hogan Grain Company

1949 Deed June 13, 1949, filed September 14, 1949
Book 923 pages 330-334
Martin J. Hogan and others
to
John R. Dunn

1949 Deed September 20, 1949
Book 923 page 405
John R. Dunn
to
Dunn Bros. Co-operative, Inc.

1985 Deed December 27, 1985
Document 85-11006
Dunn Bros. Co-operative, Inc., Vincent W. Dunn, vice-president
to
State of Illinois, Department of Conservation

B. Operation of a Grain Elevator

The operation of a grain elevator, or "elevating warehouse" as they were sometimes known, is straightforward and has changed little since Armour's Warehouse was built. Grain is delivered, dumped into hoppers, raised by scoops attached to continuous belts, then distributed through chutes into storage bins. The bins are elevated so that they will empty by gravity into the canal boats or railroad cars.

This structure is a "county" elevator, near the mid point of the journey of grain from farm to market. Farm elevators were just large enough to hold the production of a farm until it could be transported to a local collecting point, the county elevator, before being shipped to large "terminal" elevators in major cities. The county elevator was always located on a transportation route capable of handling bulk products, in this case the I & M Canal. Grain arrived at the elevator from surrounding farms by cart or wagon. Before being unloaded it was weighed at a scale located in front of the office to the east of the elevator on William Street. The cart would then be pulled up a ramp into the dump shed, which was about 7' above ground level. The cart stopped on a driveway where a hydraulic lift would raise one end, emptying the grain through a grate in the floor into the funnel-shaped dump hopper below. After unloading, the cart would be weighed again, thus determining the weight of the delivered grain.

After being emptied into the dump hopper, workers opened the boot gate which allowed the grain to flow into the boot at the base of the leg. The leg is a nearly vertical bucket conveyor belt which takes the grain from the boot to the top of the elevator, the headhouse loft. The leg was operated by a rope drive turned by shafts powered by a steam engine, now replaced by electric motors.

The extant machinery in Armour's Warehouse probably dates from M.J. Hogan's ownership, as most of it can be identified in an 1897 catalog of the Weller Manufacturing Company of Chicago. The conveyor belts were rubberized canvas. Based on the diameter of the head pulley vs. the centrifugal force required for proper discharge of material, 12" x 6" buckets mounted at 14" centers as in Armour's Warehouse, could move 3750 cubic feet per hour, or 3000 bushels per hour. If the speed were too great, no grain would be discharged. If too slow, the grain would drop out.

After the grain was released from the dump hopper into the boot, the buckets carried it up the leg to the top of the elevator where it emptied into the turn head. The turn head had a moveable spout which directed the grain into numbered chutes leading into the corresponding individual bins for storage. Secondary turn heads in the chutes could be used to distribute the grain among adjacent bins. From the bins the grain could be loaded by chutes directly into canal boats. If necessary, grain could be moved horizontally using "spiral conveyors," which were steel augers, typically 8"-10" in diameter, mounted in trough-like conveyor boxes. The spiral conveyors were powered from the line shafting. The canal boats would then transport the grain to large terminal elevators in Chicago.

Armour's Warehouse originally had three dump hoppers and three legs serving thirteen bins. Some of the bins could be filled from more than one leg. At a later date, however, the elevator was partitioned into seventeen bins. A fourth leg is visible at the northwestern corner of the elevator in the historic photograph. (See HAER photographs.) Judging from the chute, it served the corn cribs to the west of the elevator. A fifth leg, attached to the boilerhouse chimney and also visible in the historic photograph, was probably for the cobs used to fire the boiler.

A railroad spur was added which allowed the grain to be shipped either by canal or rail. Surrounding properties necessitated the use of a switchback to bring the siding alongside the structure. The elevator had not been designed with rail transport in mind, because the bottom of the bins are too low to allow gravity to feed the grain into railroad cars. Instead, the grain must be elevated a second time and fed by a special chute leading directly to the railroad siding.

C. Alterations

The Sanborn Fire Insurance Maps of Seneca from 1892 to 1924 illustrate some of the alterations and features of Armour's Warehouse during the years of M.J. Hogan's ownership. The 1892 map indicates that there were three corn cribs to the west of the elevator, the first of which was attached to the elevator. The power plant on the east side of the elevator provided steam power to the elevator by burning coal and cobs. Machinery included one Victor Corn Sheller & Cleaner located in the #1 corn crib and an Excelsior Oat Clipper & Separator. In addition, a railroad siding served the north side of Armour's Warehouse and included scales for weighing the railroad cars. An office was located on the northeast side of the property on William Street. Directly in front of the office to the north were scales used to weigh farm wagons.

The 1898 Sanborn map shows few changes to the Hogan elevator. It does tell that the power plant provided 40 horsepower and that a "dust collector on rf" [roof] existed. Four elevators were in the warehouse and the Excelsior Oat Clipper & Separator was "not used".

By 1907 Hogan's operation included several additional buildings, including a coal-shed to the north of the railroad siding (visible in the historic photograph). To the south of the office was a coal/hay shed. Changes took place in railroad transport as well. By 1907 the railroad scale had been enclosed in a shed attached to the elevator. The railroad siding had also been expanded to exit to the northwest. This probably increased efficiency as the cars needed to be backed up only a limited distance, then they could exit directly forward to the main line. Previously they had to back out to the main line. In addition to these changes, a dust vault had been installed to the north of the power plant. Finally this is the first map which indicates the separate capacities of the elevator and corn cribs, 70,000 and 25,000 bushels respectively.

The 1913 insurance map illustrates that the #3 corn crib (northernmost) had been removed. The map also indicates that the elevator was constructed in 1861. Elevator capacity was then given as 75,000, in comparison with 1907's 70,000 bushels, which may suggest that changes in bin floors or bin partitioning increased capacity. The two remaining corn cribs' capacity was 25,000 bushels, which was no decrease from the 1907 capacity of three cribs. Hogan now had two cleaners, one clipper and a sheller. In addition, Hogan was using his coal/hay shed exclusively for coal, perhaps indicating an increased volume in his coal handling sideline.

The important change from steam power to electricity occurred sometime between 1913 and 1924. After the conversion to electricity, each leg was driven by an electric motor which was placed in the headhouse loft next to the top of the leg. Although the power plant remained standing on the 1924 map, the cob house was gone. Hogan's business had also added a seed warehouse.

In addition to changes noted in the Sanborn Fire Insurance Maps, other alterations to the grain elevator have been made over the years. One of the most obvious changes is the addition of corrugated sheet metal siding over the original clapboard structure. Sheet metal roofing was similarly placed over the original wooden shingles on the roof. The Peavy Story emphasized that before the innovation of concrete grain elevators, fire was the greatest hazard to wooden grain elevators and expensive insurance rates reflected that danger. Metal siding was one answer to keep fire insurance rates low and at the same time protect the elevator. Plans for Grain Elevators stressed that a metal cornice could keep out sparks from locomotives and thus reduce the fire hazard. This book also noted that galvanized steel siding was as reasonably priced as wood and was superior to wood in maintenance.

Another important alteration was the partitioning of several bins. Armour's Warehouse originally had thirteen bins which were divided by plank walls. Later, two bins in the center and one bin at the south wall of the elevator were partitioned. Bins 10 and 13 were divided by crib wall construction, that is, stacked 2 x 4s. The bottoms of some bins were also modified from being flat bottoms to inclined floors. Also added was chute L.5 which allowed direct loading from the headhouse loft into railroad cars.

C. Machinery

The Weller Manufacturing Co. Catalogue No. 14, although undated, includes price lists dated March 1, 1897. A copy of the catalog is in the HAER library. The catalog provides drawings and describes most of the machinery in the grain elevator, some of which still remains. Included in the catalog is the Victor Corn Sheller & Cleaner (pp. 110-111), which was identified in the Sanborn Maps. The machine was located in the former #1 corn crib to the west of Armour's Warehouse. According to the Weller Catalog, the combined corn sheller and cleaner was especially adapted for warehouses where lack of space made it inconvenient to have a separate sheller and cleaner. Weller advertised this machine as being as efficient as machines having the separate functions of cleaning and shelling. The machine was described as follows: "The sheller is situated inside the revolving screen, and as the corn is being shelled, it and the cobs fall on the moving screen, where a separation is made, the cobs passing out at the tail of the screen. In the passage of the shelled corn from the screen, it is subjected to a powerful suction of air from a fan at the head of the screen."

Another piece of equipment in Armour's warehouse that Weller featured was the car puller. Located in the northeast corner of the elevator next to the railroad siding, the car puller moved railway cars into proper position for loading. Several cars could be easily positioned and loaded without needing a locomotive to move them. A double sheave frame (p. 71) located in the outer wall of the dump shed is the only remaining evidence of the car puller. It may have been powered by the 48" belt pulley at the east end of the main drive shaft.

Page 37 of the Weller Catalog shows the spiral jaw couplings which were fitted to the overhead main drive shaft on the operating floor of Armour's Warehouse, as well as the shaft in the headhouse level. The 24" diameter plain swinging tension carriage located at the bin level is discussed on page 29. The weights on the carriage provided tension on the ropes which drove the sheaves for the bucket conveyors. Weller describes the friction clutch and cut-off coupling, used on the main drive shaft, on pages 4 and 5. The company obviously felt these were quite well designed: "In view of the simplicity of this clutch, the accompanying illustrations render a detailed description of its operation unnecessary, as this will be seen at a glance." The various belt pulleys and rope sheaves can also be found in the Weller catalog, as well as other miscellaneous hardware.

A notable feature of grain elevators was the manlift, which was located in the east end of Armour's Warehouse. The manlift gave rapid access to the bin level via a wooden car lifted by a weighted rope running over a pulley at the headhouse loft. The ascent was slowed by a foot operated brake. To return to ground level, one pulled the car down hand-over-hand using a vertical rope in the car's center which was fixed at the basement and loft.

Manlifts were a "very useful addition" to elevators promoting machinery inspection and maintenance. According to the Farm Journal Plans for Grain Elevators, fire insurance companies promoted the use of manlifts, realizing that "the elevator man would inspect the machinery in the cupola more frequently if the labor of the long trip to the Texas were obviated and granted such a generous reduction in the rate on elevators so equipped that manlifts really cost the elevator man nothing" (page 390). Manlifts were a great savings to elevator operators because they did reduce fire insurance rates, which were sometimes as high as 1% of an elevator's capacity (The Peavy Story). Farmer's groups came to believe the absence of a manlift was a "...serious defect. No man is going to climb 50 feet of stairs any oftener than he is compelled to, and certainly the machinery and head pulleys in the cupola will not receive the attention that they wud [sic] if a manlift had been installed" (Plans for Grain Elevators, page 371).

D. Historical Context

The function of a country grain elevator such as Armour's Warehouse was to provide a local market for area farmers. According to the United States Department of Agriculture Bulletin No. 558 (July 28, 1917), the country elevator served "...as a collecting point for the surplus grain of a community, furnishing at the same time the most direct route to a favorable market." Grain elevators were the collecting point whereby grain could be shipped to large marketing centers, for instance, Chicago as the center for grain from the Illinois and Michigan Canal corridor. Before the advent of elevators, farmers had to dispose of their grain at distant points, which was inconvenient as well as risky. Producers had to load their grain and travel long distances over poor roads only to find that the market may not have had

any willing buyers. Grain elevators eliminated this problem by providing a local market. Farmers could now dispose of their grain in a day instead of the usual days spent getting to the market. Elevators could also be used for grain storage until more favorable market conditions existed.

The historic name for the Seneca grain elevator is Armour's Warehouse. This name appears in a quit claim deed from George Armour to James Armour, filed January 1869 (Deed book 124, page 280). The name "Armour's Warehouse" appears in subsequent deeds as well. Historically, grain elevators were referred to as "elevating warehouses" or "elevator warehouses," according to the Annual Statement for the Chicago Board of Trade, 1861.

In 1860 John Armour purchased a section of property in the original town of Crotty, which has officially been known as Seneca since 1957. Armour purchased Block 3, which came to be known as Armour's Addition, from Jeremiah Crotty, Seneca's founder, who had come to the area as a contractor to work on the Illinois and Michigan Canal construction. According to the Sanborn Fire Insurance Maps of 1907, 1913, and 1921, the elevating warehouse was built in 1861. The 1886 History of LaSalle County Illinois names John Armour as having built the warehouse in 1862. (Note: John Armour is not of the Armour meatpacking industry.)

The Armour family appears to have been quite prominent in the grain business. In the 1858 and 1866-67 Ottawa City Directories John Armour was listed as a "grain dealer" residing at the corner of Madison and Clinton Streets in Ottawa. It is interesting to note that by 1872, "Armour's Warehouse" was being referred to by the more modern term we use today, "Armour's Grain Elevator," the listing given to John Armour in the LaSalle County General Directory for the Village of Seneca. Armour was also a prominent businessman in the Ottawa community, serving as vice-president of the First National Bank of Ottawa. John Armour's brother, George, was a member of the Chicago Board of Trade and was owner (with Dole) of an 850,000 bushel elevator in Chicago in 1861. In addition, Archibald Armour is listed as a retired grain dealer in The Past and Present of LaSalle County, Illinois, published in 1877. The 1860 LaSalle County Census also noted that Archibald Armour was a lime dealer.

A native of Argyleshire, Scotland, John Armour was a produce dealer according to the 1860 census and had real estate and personal property valued at $55,000. John Armour's will, executed in 1868, demonstrates that he was a very successful businessman. At the time of his death, Armour's estate was valued at $79,000; of this, his real estate in Blocks 2 and 3 of Armour's addition to Crotty, including the grain elevator, were sold to his brother for $21,200. It is also interesting to note that Armour's estate included one-half ownership in a canal boat as well as three mules in Seneca. Armour was a founding director of the Seneca Bridge Company and held stock in numerous other local firms, including the Illinois Bridge Company, Ottawa Coke and Light Company, Ottawa Hotel Company, and the First National Bank of Ottawa. It appears, therefore, that although Armour's Warehouse was an important part of Seneca's commerce, Mr. Armour himself was more active in the Ottawa business community than in that of Seneca.

Following John Armour's death in 1868, a number of equally prominent businessmen operated the grain elevator. James Armour ran the operation until 1873 when Michael Byrne and Nelson J. Rulison purchased the property from James Armour's heirs. Mr. Rulison, like the Armours, was a well known area grain merchant. According to the 1870 LaSalle County Census, Rulison resided in Ottawa and was employed as a boatman. The Seneca News Illustrated Supplement tells that Rulison came to Seneca in 1873 and engaged in the grain business, owning the Armour grain elevator for four years, until 1877, then again from 1883-86. The Illinois State Gazeteer and Business Directory for 1882 lists Rulison as a dealer in grain and seeds. According to the 1886 History of LaSalle County Illinois, Rulison also owned a grain elevator on the south side of the Illinois and Michigan Canal in Seneca, shipping 750,000 bushels annually from both warehouses. During Rulison's second ownership of Armour's Warehouse, the Kankakee and Seneca Railroad Company was deeded a right of way to the grain elevator in 1883. This expansion of the elevator's business to include railway transportation as well as canal transport was not popular with one Brookfield farmer who objected to the Canal Commission that Rulison's business with the railroad was detrimental to the business of the canal. Furthermore, the farmer recommended that the Commission take action against Rulison's business because the elevator was on leased canal property. In addition to being known as a grain dealer, Rulison is also remembered for starting a private bank in Seneca, conducting business there until 1892 when the State Bank of Seneca was organized. The Seneca News Illustrated Supplement of February 27, 1897, declared Rulison to be "...a public spirited man and had probably done more for the progress of Seneca than any other man who ever lived here."

During the years between Nelson Rulison's ownership of Armour's Warehouse, Guy C. Griswold owned and operated the business. Griswold is listed in the 1870, 1880 and 1882 editions of the Illinois State Gazeteer & Business Directory as a grain dealer. The 1877 Past and Present of LaSalle County reports that the warehouses of Garden, Bruce and Griswold shipped 900,000 bushels of grain in the preceding year. Griswold reportedly sent as much, if not more than any other single house along the canal, in excess of 550,000 bushels. Griswold presumably shipped some of his grain from the Armour elevator he purchased in 1877. It is interesting to note that Griswold was concerned with the railroad's competition with the canal. In an 1890 letter to the Canal Commission, Griswold warned that a Rock Island Railroad official boasted that the railroad would "...dry up the canal and all its patrons." The recipient noted that "It is very apparent from the records of the Canal office that the railroads were trying to put the I & M Canal out of business."

In 1886 Martin J. Hogan and Howard Neilson of Marseilles, Illinois, agreed to purchase Nelson Rulison's two elevators, the "Hossack Elevator" on the south side of the canal as well as "Armour's Warehouse", together with its machinery and corn cribs. Hogan and Neilson were granted the warranty deed for Armour's elevator in 1890. According to O'Byrne's History of LaSalle County, Hogan, like Rulison, began as a boatman on the canal. He was also in the grain business in Marseilles before going to Seneca. M.J. Hogan was a

notable figure in the Seneca community, serving as president of the local government and the Board of Education as well as chief of the fire department. In 1919 he became president of the newly organized Farmer's Trust and Savings Bank. In a booklet to commemorate the Seneca Area Centennial Celebration, Martin J. Hogan wrote that his grandfather had purchased the grain elevator because he felt Seneca had advantages as a grain center owing to the three railroads which passed through the town. He also noted that M.J. Hogan still used the I & M Canal. Hogan credits his grandfather with building many other grain elevators along the canal and remembers 400 wagons a day patronizing the Seneca elevator. The Seneca News noted that Hogan's grain elevators had a capacity of 250,000 bushels and that Hogan also owned a fleet of boats on the canal. M.J. Hogan later dissolved his partnership with Neilson and in 1906 incorporated his grain business into the M.J. Hogan Grain Company. The object of Hogan's corporation was "to buy, sell and deal in grain, seeds, hay and the products of the same; to buy, sell and deal in stone, coal, lumber, builder's hardware, paints, oil, lime, cement, and all articles pertaining to the retail lumber business" (Deed book 464, page 205).

After Hogan's ownership ended in 1949, the elevator was operated by Dunn Brothers Co-op, Inc. The Illinois Department of Conservation obtained the deed in 1985. The elevator is now leased to a local farmer and is currently in use as a grain warehouse.

PART II. PHYSICAL DESCRIPTION

The architectural character of the grain elevator is heavy timber post and beam construction. The 75,000 bushel capacity warehouse has a limestone foundation. The original clapboard siding is now covered with corrugated sheet metal. The grain elevator is adjacent to the Illinois and Michigan Canal and was built specifically to serve it, with spouts loading grain directly onto the canal boats.

The internal wooden structure is in good condition. The sheet metal siding is rusting. The attached railroad shed is in poor condition as it leans and its wooden platform is rotting and full of holes.

The rectangular structure is four bays wide by eight bays long, 40'-5" by 80'-4" respectively. The east elevation has a 6'-3" projection two bays wide which encases the stairwell and manlift. The grain elevator is 65'-3" high from the operating floor to the headhouse ridge. The original siding, still present under the sheet metal, was clapboard, except where the siding follows the roofline, where it is flush tongue and groove (see the historic photograph). The building is four stories and has a basement. Each floor serves a functional purpose as follows: the first is the operating floor, the second level is the bin level, the headhouse is at the third level, and the headhouse loft is the fourth level. The grain elevator has a driving shed

with three dumping stations on the north side. A railroad shed is attached to the north side of the driving shed.

The limestone foundation has perimeter walls 2' thick with intermittent openings allowing for access to machinery. The perimeter sill beams are 12" x 12". Spread footings, 7' x 2', support north-south beams, also 12" x 12", which in turn support the interior columns. The joists supporting the operating floor run east-west and are 2" x 12", staggered slightly so that they lap over the sill beams.

The basement area beneath the operating floor is called the pit. It houses the boot at the base of each leg. The pit is 4' below the bottom of the joists and provides enough space for maintenance of the base pulley in the boot. The pit is partially filled with spilled grain.

Directly above the pit is the operating floor, which has a ceiling height of 10' to the bottom of the beams supporting the bins. Exterior columns are 12" x 12", interior columns 14" x 12". All the beams are 12" x 12", with the east-west beams sitting in mortises. Knee braces are 5" x 6" and set at 45 degree angles with mortise and tenon joints. The operating floor also was the point at which power from the steam engine came in to run the pulleys for the legs. Another operation on this floor was to open the boot gates to allow the corn to go from the dump hoppers into the boots. In addition, gates could be opened in the bottom of each bin, allowing the grain to be loaded onto the canal boats. Spiral conveyors were used to move the grain horizontally.

The 10'-5" x 80' dump shed is 5' above the operating floor and was approached via a dirt embankment, now replaced by a concrete structure. The dump shed runs the length of the elevator's north wall. It accommodated farm wagons for unloading grain into one of three dumps. The dump floor is framed with 6" x 8" columns and beams with 2" x 6" joists running east-west. Floorboards are 2" x 10" planks and are covered by metal plates at the east end. The north exterior wall supporting the shed roof has 6" x 6" columns which align with the columns in the grain elevator wall. The dump shed also has remains of rubberized canvas strips on which the wagons drove. These strips probably helped prevent the wagons from sliding when they were tilted by the hydraulic lifts to dump the grain. In addition, the canvas strips protected the wooden floors from excessive wear caused by iron wagon wheels. The canvas strips are the same type of material and the same width as the elevator belts.

A 14' x 57' railroad shed is attached to the drive floor, protecting the railroad scale and loading operations from the weather. The stud wall construction is 2" x 4", 2' on center, with shiplap siding. 2" x 6" rafters, 2' on center, carry the roof. The L.5 chute exited from the side wall of the elevator's north facade to dump grain into the railroad cars. A door from the dump shed leads to a 2'-3" x 12' long platform that was probably used to adjust the end of the L.5 chute when loading grain. Another small shed is attached to the railroad shed and houses the Fairbanks scale beam where the weight of the railroad cars was read. The scale mechanism itself is below the

railroad platform. A rather flat roof, sloping only 6 degrees, is comprised of 2" x 6" rafters and extends from the elevator's north wall, over the drive floor roof and railroad shed.

The elevator originally consisted of fourteen bins having plank wall construction. Each bin was 24' deep and encompassed one or more 10' x 10' bays. At some point, two center bins were partitioned. The center bin farthest east was partitioned into bins 10, 11, 13, and 17 by crib construction, that is, stacked 2 x 4s. Crib construction shortened the bin walls by approximately 6" per side. Another center bin, the second from the west, was partitioned into bins 8 and 14 by plank wall construction. Bin numbers are based on notations located in the headhouse loft. Bins 1, 2, 9, and 13 are clearly labeled. Bins 2, 10 and 13 are lined with paper. The bin level is also the terminus for the manlift. Catwalks facilitate the maintenance of this level and are built of miscellaneous 1" planks carried by three 2" x 6" joists running east-west.

Construction at the bin level, like that of the floor below, is of 12" x 12" columns on the exterior walls and 12" x 14" interior columns. The columns and bin walls were reinforced by tie rods, necessary to contain the weight of the grain against the walls. 4" x 6" knee braces were used for lateral support for the large two-bay-by-two-bay bins in the center of the elevator. Structural supports at the top of the bins were 10" x 10" east-west beams having butt joints and 10" x 10" single north-south beams. 6" x 8" angled braces provided additional support against the wind. Two catwalks facilitate access at the bin level. Both the legs and drive ropes pass through the bins encased in wooden chases.

The supporting columns of the headhouse and headhouse loft levels are 9" x 9". The top of the grain elevator did not require the heavier 12" x 12" and 12" x 14" columns of the bin and operating floors because the upper levels did not carry the weight of the grain. The headhouse and headhouse loft are only two bays wide. Shed roofs just above the bin level cover the two outer bays.

The headhouse level houses the chutes for directing the corn into the bins. The chutes are rectangular boxes with butt joints using 1" thick boards of various widths. The lower drive tension pulley is on this level. The rope chases begin at this level and protect the drive ropes as they pass through the bin level. Rope chases are 9" x 6" except that the rope chases for the east leg are larger, 12" x 6", to accommodate more ropes. The rope power transmission from the operating floor remains only on the original east leg. Today, power for the elevators is provided by electric motors and belt drives which are located at the head pulley of the west and center elevators and on the operating floor for the east elevator.

The headhouse loft level supports the gable roof. The roof slopes 33 degrees and is covered with wooden shingles which have been covered with sheet metal. At this level 8" x 8" sills support 9" x 9" columns. The roof rafters and ties are both 2" x 6" with the ties located 6'-7" above the loft floor. In

the loft, the head pulley axles are mounted in pillow blocks on 4" x 6" supports mortised into 6" x 6" columns fastened to the roof joists and floor. An 8'-10" diameter pulley and axle rest on similar supports above the east staircase. Each leg has a wooden head in the headhouse loft. Each has a 10" cast iron turn-head spout by which the grain is directed into numbered chutes which dump it into the corresponding bins.

A stair tower is in the east pavilion and runs from the operating floor to the headhouse loft. Stairs originally went to the basement. The u-return staircase is constructed of 2" x 10" steps and 2" x 8" stringers. The first two short runs and landings have been replaced by three runs. The first run now blocks the path of the stairs descending into the basement. The staircase provides the only access to the headhouse level. There is also a ladder from the headhouse to the headhouse loft near the center leg. This ladder is of 1" x 2" rungs on 1" x 3" stringers. Generally, each original bin also has a ladder which allowed access to the bottom of the bin. These ladders are miscellaneous planks nailed to the 4" x 8"s which secure the tie rods. There are also two sets of stairs at the east and west ends of the elevator which lead from the operating floor to the drive floor.

The original windows have six-over-six-light, double-hung sash, 5'-2" x 3', framed in 2" x 6"s. The east facade has two windows at the headhouse loft level as well as two windows between the operating floor and the bin level. The west facade also has two windows at the headhouse level and two at the bin level. The north facade includes four windows at the headhouse level at every other bay. There are also three windows at the operating floor level. The south facade which faces the canal has three small windows, 2'-4" x 1'-10" at the headhouse loft level. These windows align with the turnhead spouts to provide light and ventilation. At the headhouse level are four windows at every other bay. The operating floor has three 5'-2" x 3' windows as well as three windows, 2'-2" x 1'-2". The smaller windows accommodated the grain chutes to the canal. The larger windows may have also been used for chutes.

A single swing 7'-6" x 2'-4" door leads from the drive floor to the railroad shed. There are two large sliding doors on steel runners providing access to the canal on the south facade. There is also one door, 8' x 4', on the operating floor of the east facade. Two doors are at the operating level of the west facade.

D. Site

1. General setting: Armour's Warehouse sits on the north bank of the Illinois and Michigan Canal in downtown Seneca, Illinois. To the north and west is a lumberyard, to the east of the elevator are downtown businesses. A canal turning basin was originally on the west side of the elevator.

2. Outbuildings: Attached to the west end of the driving floor of Armour's Warehouse is a wooden corn crib which probably dates to the 1930s. Other associated structures no longer standing are noted on the Sanborn maps and are visible in the historic photograph.

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Prepared by: Dawn E. Duensing
Historian
National Park Service
August 21, 1987

PART IV. PROJECT INFORMATION

Documentation of three structures in the Illinois and Michigan Canal National Heritage Corridor was undertaken by the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER), a division of the National Park Service, in the summer of 1987. These canal-related structures were identified as significant by previous surveys conducted by HABS/HAER in the I & M Canal Corridor. Under the general direction of Robert Kapsch, Chief of HABS/HAER, the project was managed by historian Alison K. Hoagland and directed by architect John A. Burns, AIA. The field work was undertaken by architecture technicians Susan E. Keil (University of Houston), foreman, Ellen F. Stoner (University of Illinois), Gilbert E. Witte (University of Illinois), and historian Dawn E. Duensing (University of Northern Illinois). The drawings were edited by Frederick J. Lindstrom (Virginia Polytechnic Institute and State University) and the data were edited by Alison K. Hoagland and John A. Burns.